Guianodendron, a New Genus of Leguminosae (Papilionoideae) from South America

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Abstract. The new genus *Guianodendron* Schütz Rodrigues & A. M. G. Azevedo (Leguminosae, Papilionoideae, Sophoreae) from Guyana and the Brazilian state of Amazonas is described and illustrated, and a new combination, *Guianodendron praeclarum* (Sandwith) Schütz Rodrigues & A. M. G. Azevedo, is made. The genus is characterized by a radial corolla with auriculate petals; five stamens; reduced ovule number; a straight hypanthium; indehiscent, flattened, and sutural-winged fruits; persistent bracts and bracteoles; leaflets with a papillate abaxial epidermis; and ovate to ovate-elliptic markedly striate stipules.

Resumo. O gênero novo *Guianodendron* Schütz Rodrigues & A. M. G. Azevedo (Leguminosae, Papilionoideae, Sophoreae), ocorrente na Guiana e no estado brasileiro do Amazonas, é descrito e ilustrado e uma nova combinação é feita, *Guianodendron praeclarum* (Sandwith) Schütz Rodrigues & A. M. G. Azevedo. O gênero é caracterizado por apresentar corola radial com pétalas auriculadas, cinco estames, número reduzido de óvulos, hipanto reto, frutos indeiscentes, achatados, com suturas aladas, brácteas e bractéolas persistentes, folíolos com epiderme abaxial papilosa e estípulas oval ou oval-eliptícas, marcadamente estriadas.

Key words: *Acosmium*, Brazil, *Diplotropis*, *Guianodendron*, Guyana, Leguminosae—Papilionoideae.

Acosmium praeclarum (Sandwith) Yakovlev is a medium-sized to tall tree reaching 35 m, recorded until now exclusively from Guyana, where it is considered a major timber tree (Polak, 1992). During the course of a revision of the Neotropical legume genus *Acosmium* Schott (Leguminosae, Papilionoideae, Sophoreae), it became evident that *A. praeclarum* differs markedly from the remaining species in several vegetative and floral characters, indicating that these taxa might not be congeneric. This was previously observed by Sandwith (1947), who pointed out that anomalous characters of the species (as *Sweetia praeclara* Sandwith) could justify the creation of a new legume genus. Later, Yakovlev (1969) included *Acosmium praeclarum* in his monospecific *Acosmium* sect. *Praeclara* Yakovlev, which was characterized by five stamens and punctate leaflets. In addition, our morphological analysis showed that it differs from all other *Acosmium* species in having auriculate petals, a reduced ovule number (1, rarely 2), persistent bracts and bracteoles, leaflets with a papillate abaxial epidermis, as well as ovate to ovate-elliptic markedly striate stipules. Studies on the seedling morphology of *Acosmium* (Rodrigues & Tozzi, in prep.) reveal that *A. praeclarum* may be distinguished by possessing cryptohypogeal seedlings (Polhill, 1981).

The combination of these characters does not fit comfortably within any known papilionoid genera (Lewis et al., 2005), and therefore a new South American genus, *Guianodendron*, is described herein.

Guianodendron Schütz Rodrigues & A. M. G. Azevedo, gen. nov. *Acosmium* sect. *Praeclara* Yakovlev, Notes Roy. Bot. Gard. Edinburgh 29: 355. 1969. TYPE: *Guianodendron praeclarum* (Sandwith) Schütz Rodrigues & A. M. G. Azevedo. Figure 1.

Arbores Leguminosae Papilionoideae tribui Sophoreis pertinentes. Hoc genus petalis subaequalibus, laminis sagittatis auriculis inflexis carnosis, staminibus 5 liberis, hypanthiis rectis, bractis bracteolisque persistentibus, stipulis ovatis vel ovato-ellipticis striato-nervosis, ovulis 1 (raro 2), leguminibus indehiscentibus applanatis alato-marginatis distinctum.

Figure 1. *Guianodendron praeclarum* (Sandwith) Schütz Rodrigues & A. M. G. Azevedo. —A. Flowering branch (*S. S. & C. L. Tillett 45433*). —B. Detail of glands clustered at flower axils. —C. Detail of glands clustered at bracteole axils. —D. Flower. —E. Standard petal. —F. Wing petal. —G. Flower without petals and anthers. —H. Flower in longitudinal section, showing the hypanthium. —I. Ovary in longitudinal section, showing the single ovule. —J. Fruit, with persistent bracts (*D. B. Fanshawe in Forest Dept. 3286*). [Drawings from the NY isotype *Aitken in For. Dept. 2353* unless otherwise noted].

Guianodendron praeclarum (Sandwith) Schütz Rodrigues & A. M. G. Azevedo, comb. nov. Basionym: *Sweetia praeclara* Sandwith, Contr. Gray Herb. 165: 25. 1947. *Acosmium praeclarum* (Sandwith) Yakovlev, Notes Roy. Bot. Gard. Edinburgh 29: 355. 1969. TYPE: Guyana. Essequibo River: Makauria Creek, 1 Mar. 1934 (fl), *Aitken in For. Dept. 2353* (holotype, K not seen, photos of holotype neg. 2805 at F, NY; isotype, NY). Figure 1.

Trees to 35 m, with obtriangular crown, base buttressed, trunk to ca. 50 cm DBH, bark light brown, lenticellate; branchlets glabrescent. Stipules ovate to ovate-elliptic, markedly striate, 4–10 × 2–5 mm, caducous. Leaves alternate, imparipinnate, 5- to 9-foliolate, petiole and rachis glabrous, canaliculate along upper side, petiole 1.8–3.5 × 0.15–0.2 cm, rachis 3.6–7.5 cm long; petiolules glabrous, plicate, 2.5–4.5 × 1.2–2 mm; leaflets alternate or opposite, 4.8–14 × 2.3–6 cm, elliptic, oblong to obovate, concolorous, glabrous above, strigillose and black punctate beneath, apex acuminate or acute, base cuneate or obtuse, venation brochidodromous, costa sunken above, slightly prominent beneath, secondary veins 8 to 14 pairs, slightly prominent on both surfaces, forming an angle of 50°–65° with the leaflet costa. Inflorescence paniculate, axillary or terminal, usually 2 or 3 panicles forming an axillary fascicle, 6–15 cm long, peduncle and the floriferous axis pubescent to glabrous; primary bract (at inflorescence base) similar to stipules, caducous; secondary bracts (at pedicel base) ovate-lanceolate, 0.8–1.2 mm long, usually persistent; bracteoles (at pedicel apex) ovate, 0.5–0.7 mm long, persistent; pedicel 1–1.5 mm long, with a ring of red-brown glands clustered at axils of flower and bracteoles; buds obovoid. Flowers 5–6 mm long; hypanthium straight, 1–1.3 mm long; calyx pubescent, actinomorphic, sepals 5, tube 0.9–1.1 mm long, lobes 1.1–1.5 mm long; corolla actinomorphic, petals 5, white, short-clawed, sagittate-lanceolate, with carnose and inflexed auricles at base, pubescent or rarely glabrous, 4–4.3 × 1–1.5 mm; stamens 5, free, filaments 3.5–4.5 mm long, anthers 0.5–0.8 mm long, widely elliptic; ovary 1.5–3 mm long, ellipsoid, tomentose, 1 (rarely 2) ovulate, stipe 1–1.8 mm long, style 2–2.5 mm long, stigma small, punctiform. Fruits indehiscent, flattened, oblong, 1-seeded, 5–7.5 × 1.2–2.2 cm, coriaceous, reticulate, brown, glabrous, with sutural wing 2–2.3 mm wide, stipe 3–4 mm long. Mature seeds not seen, immature oblong, slightly oblique to fruit length.

Etymology. The generic name combines the name of the country where it is mostly found, Guyana, with the Greek word for tree, dendron.

Local names and uses. Guyana: blackheart. The wood is used for house posts and furniture (Sandwith, 1947).

Distribution and habitat. Occurring in central and north central Guyana, the new taxon is reported for the first time from Brazil, from the state of Amazonas. *Guianodendron praeclarum* occurs in Guyana in different forest types (wallaba forest, *Mora* forest, mixed lowland forests, and marsh forest), which range from high-canopied forests (canopy at 30–45 m) to lower-canopied forests (canopy at 10–17 m), usually on sandy, alluvial, loamy, and periodically inundated or well-drained soils (Hueck, 1972; Polak, 1992). In Brazil, it was found only in the caatingas amazônicas from upper Rio Negro, on sandy and wet soils, in the base of the Guiana Shield.

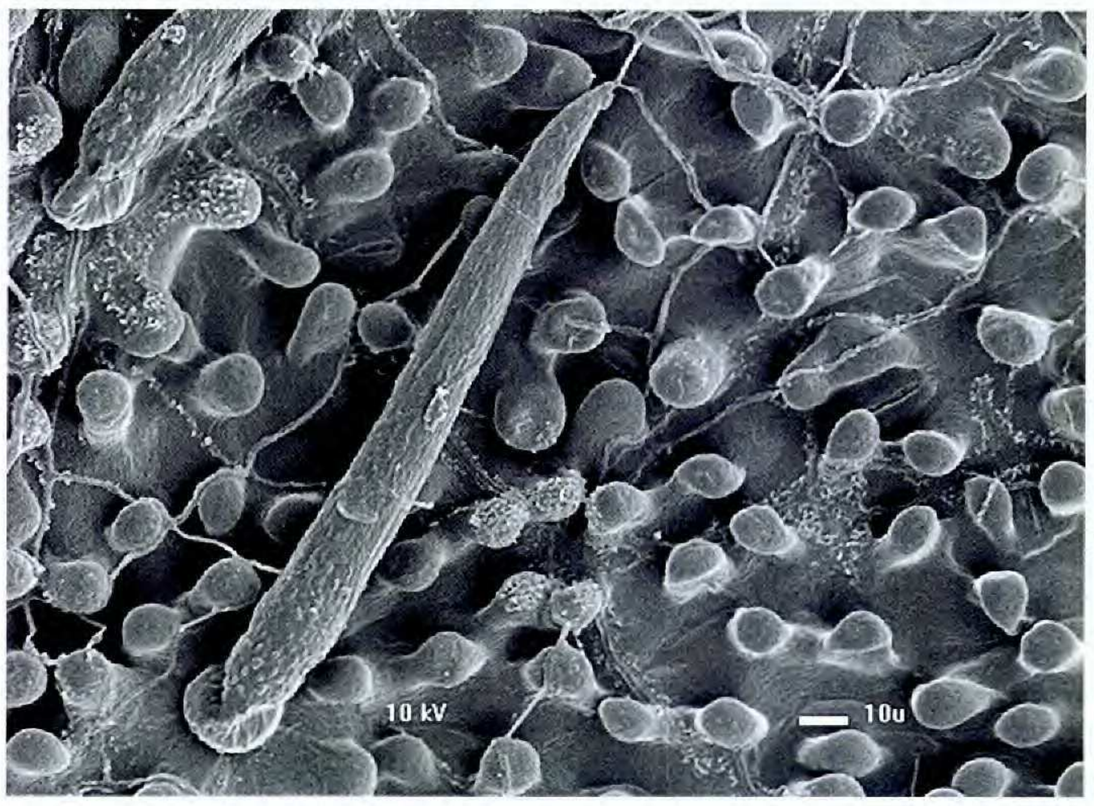

Figure 2. SEM image of abaxial surface of leaflets of *Guianodendron praeclarum* (Sandwith) Schütz Rodrigues & A. M. G. Azevedo, showing a papillate epidermis (*N. T. Silva & U. Brazão 60916*). Scale bar = 10 μm.

Phenology. Flowering specimens of *Guianodendron praeclarum* have been collected from January to September, and fruiting specimens from September to November.

Relationships. Recent phylogenetic analyses (Pennington et al., 2000, 2001; Crisp et al., 2000; Wojciechowski et al., 2004) have shown that the genistoid clade of Papilionoideae includes several Neotropical genera of Sophoreae, such as *Acosmium*, *Bowdichia* Kunth, *Clathrotropis* Harms, and *Diplotropis* Bentham, and probably the pantropical genus *Ormosia* Jackson, which may be among its most basally branching lineages (Wojciechowski, 2003). *Guianodendron praeclarum* shares some reproductive and vegetative features with *Diplotropis*, which is a South American genus comprising 12 species (Lima, 1985). *Diplotropis* species and *Guianodendron praeclarum* present persistent bracts and bracteoles, an auriculate standard petal, and samaroid fruits distinctly winged on the margin. Moreover, they have cryptohypogeal seedlings without cataphylls (Polhill, 1981; Polak, 1992). In addition, *Guianodendron praeclarum* and the two species of *Diplotropis* sect. *Racemosae* H. C. Lima have leaflets with a papillate abaxial epidermis (Metcalfe & Chalk, 1957; Herendeen & Dilcher, 1990) (Fig. 2). However, *Guianodendron prae-*

clarum does not fit within the limits of *Diplotropis* because of its radial flowers with 5 subequal auriculate petals, 5 stamens without staminodes, smaller flowers, a straight hypanthium, and reduced number of ovules (1, rarely 2). By contrast, *Diplotropis* has zygomorphic flowers, in which only the standard petal is auriculate, 10 stamens (*Diplotropis* sect. *Diplotropis*) or 5 stamens with 5 staminodes (*Diplotropis* sect. *Racemosae*), larger flowers, curved hypanthium, and 3 to 6 ovules (Lima, 1985; Lima & Aymard, 1999). A more detailed phylogenetic analysis of the basal elements of the genistoid clade, using molecular as well morphological characters, would appear to be in order.

Additional material examined. BRAZIL. **Amazonas:** Serra Pirapucu, rio Negro, Cauaburi, Maturacá, *N. T. Silva & U. Brazão 60916* (MG, NY). GUYANA. **Cuyini-Mazaruni:** Bartica-Potaro road, near 14th milepost, *N. Y. Sandwith 1109* (NY, U); E bank of Mazaruni river, opposite Kuninang village, betw. Kukui & Kako rivers, *S. S. & C. L. Tillett 45433* (NY). **Upper Demerara-Berbice:** Mabura, Waraputa compart., ca. 25 km S of Mabura, M. Polak, *H. Rijpkema & S. Roberts 505* (NY, U). **Uncertain location:** Keriti Creek, Essequibo River, *D. B. Fanshawe in Forest Dept. 3631* (U); Makauria Creek, *D. B. Fanshawe in Forest Dept. 3286* (F, NY, U); Moraballi Creek, Essequibo River, *D. B. Fanshawe in Forest Dept. 4033* (NY, U); mouth of Suru-a-gu-puh river, *S. S. & C. L. Tillett 45388* (NY); R.B. Blue creek, R.B. Groete creek, L.B. Essequibo River, *C. A. Persaud 331* (U).

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